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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/034,504

12/28/2001

Woo Seock Cheong

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11/15/2002

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EXAMINER

GARCIA, JOANNIE A

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 11/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/034,504

Applicant(s)

CHEONG, WOO SEOCK

Examiner

Joannie A Garcia

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-- Th MAILING DATE of this communication appears on the cover sheet with the corresponding address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22, 24 and 25 is/are rejected.
- 7) ☒ Claim(s) 23 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: .

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The disclosure is objected to because of the following informalities: On page 1, line 16, "silicon" before "epitaxial growth" should be replaced with --selective--. On page 1, line 24, "planation" before "using a CMP process" should be replaced with --planarization--.

Appropriate correction is required.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 53a in Figure 16. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 2-13, 15-19, 21, 22, 24, and 25, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 2, line 5, it is unclear which insulating layer the applicant is referring to.

In claim 6, line 6, "1000sccm" should be replaced with --1000 sccm--.

In claim 8, line 2, "selectively of the" after "wherein the" should be replaced with --selective--.

In claim 9, line 3, "DCS" after "the LPCVD method and a" should be replaced with the full name.

In claim 9, line 3, "MS" after "or" should be replaced with the full term.

In claim 10, line 2, "DCS" after "wherein the" should be replaced with the full term.

In claim 10, line 4, "150Torr" after "between 5 and" should be replaced with "150 Torr".

In claim 11, line 2, "MS" after "wherein the" should be replaced with the full term.

In claim 11, line 5, "MS" before "between 0.1 and 1 slm" should be replaced with the full term.

In claims 15, and 17, lines 3, and 2, respectively, --doped-- should precede "amorphous silicon".

In claim 17, line 4, "1 and 2 10^{20} atom/cc." after "is between" should be replaced with --1 and 2 x 10^{20} atom/cc.--.

In claim 19, line 2, --doped-- should precede "amorphous silicon".

Claim 19 recites the limitation "resultant structure" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 19 recites the limitation "flowrate of H₂" in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim 21 recites the limitation "selective silicon plug" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim.

In claim 22, line 5, "20sccm" after "sccm and up to" should be replaced with --20 sccm--.

Claim 24 recites the limitation "selective silicon plug" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

Claim 25 recites the limitation "removal" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 25 recites the limitation "oxide layer" in line 4. There is insufficient antecedent basis for this limitation in the claim.

In claim 25, line 3, --doped-- should precede "amorphous silicon".

In claim 25, line 4, --the doped-- should precede "amorphous silicon".

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, and 8, are rejected under 35 U.S.C. 102(b) as being anticipated by Hada et al (U.S. Patent 6,030,894).

Hada et al discloses forming an insulating layer 105 on a silicon substrate 101 (Column 5, lines 28-30), forming a contact hole 107 on the insulating layer (Figure 2A, and Column 5, lines 30-34), forming a silicon layer 155 on the surface of the contact hole (Column 5, lines 50-53), and forming a selective conductive plug 116/157 in the contact hole having the silicon layer (Figure 2B), wherein the selective conductive plug is formed by growing a selective crystal silicon 116 and a selective polycrystalline silicon 157 by using a UHVCVD method (Column 6, lines 1-12, and 28-35).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 14, and 18, are rejected under 35 U.S.C. 102(e) as being anticipated by Chiang et al (U.S. Patent 6,383,863).

Chiang et al discloses forming an insulating layer 12a on a silicon substrate 1 (Figure 3, and Column 3, lines 41-44), forming a contact hole 14a on the insulating layer (Figure 4, and Column 3, lines 50-52), forming a doped amorphous silicon layer 15 on the surface of the contact hole (Figure 5, and Column 4, lines 4-9), and forming a selective conductive plug 11 in the contact hole having the silicon layer (Figure 6), wherein the doped amorphous silicon layer is formed on the bottom of the contact hole and side thereof (Figure 5).

Claims 17 and 20, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang et al as applied to claims 1, 14, and 18 above, and further in view of the following comments.

Chiang et al discloses that the doped amorphous silicon layer is deposited using SiH_4 (Column 4, lines 7-9). Chiang et al does not disclose that doping concentration of silicon is between 1 and 2×10^{20} atom/cc, and that the thickness of the amorphous silicon layer is between 50 and 150 angstroms. It would have been a matter of routine optimization to determine a

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suitable doping concentration and a suitable thickness within the teachings of Chiang et al to achieve doped amorphous silicon layer formation step.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 2-7, 12, and 13, are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no disclosure of forming a gate structure on the silicon substrate, forming a first insulating layer on the gate structure, and forming an oxide layer on the first insulating layer of the gate structure prior to forming a second insulating layer which has a contact hole formed therein.

Claim 23 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 9-11, 15, 16, 19, 21, 22, 24, and 25, would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. **See MPEP 203.08.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner J. Garcia whose telephone number is (703) 306-5733. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax number for this group is (703) 308-7722 (and 7724), and (703) 305-3431 (and 3432). MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.



JAG
11/12/02

